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POLYGONUM PENNSYLVANICUM AND RELATED SPECIES.

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THE early history of the characteristic North American *Polygonum pensylvanicum* L. is not marked by complications. *P. Careyi* Olney, which may be considered its closest relative in the northern part of its range, is set off sharply by its hirsute character and thick-lenticular achene. From the introduced *P. Persicaria*, *P. pensylvanicum* is easily differentiated by its larger habit, the brighter green of its foliage and the clear pink of its larger panicles. The variations of *P. pensylvanicum* in the northern and central portion of its range have been elucidated by Fernald.¹ In the present paper a southern plant, in which the glandular hairs which clothe the upper portions of the previously proposed varieties are replaced by a rather copious strigosity, is proposed as a new variety. Western specimens of *P. pensylvanicum* var. *laevigatum* often show a considerable reduction or even entire loss of the hairy indument, but this is here mentioned as a phenomenon requiring further study before these extremes can be assigned definite systematic rank. Under *P. pensylvanicum* var. *laevigatum* is proposed, as a forma, a rather pallid plant whose glands, strongly reddened in the type, are lacking in pigment and are yellowish.

In the more southerly portions of the range of *P. pensylvanicum*, and particularly south of the continental limits of the United States, occur several closely related plants, the assignment of which to specific or varietal rank is of greater difficulty.

P. segetum HBK. described from "*alta planitie Andium Novogranatensium prope Santa Fé de Bogota in agris humidis inter segete, alt.*

¹ Fernald, *The Variations of Polygonum pensylvanicum*, RHODORA, xix. 70-73 (1917).

1365 hex.," is a close southern analogue of *P. pensylvanicum*. Meisner,¹ in comparing it with the latter, states:

"Nimis affine *P. Pennsylvanico*, recedens tantum spicis gracilioribus et calyce eglanduloso, fructifero dimidio minore et magis ovato."

The calyx of *P. pensylvanicum* is hardly glandular; the differentiation is good in other respects. Small² brought out the difference between the pointed achene of *P. segetum* and the nearly orbicular and larger one of *P. pensylvanicum*; his achene-drawings, however, slightly exaggerate the difference in character and are not on the same scale, indicating a reverse relation as to sizes. His habit-sketch also exaggerates the ciliation of the leaves, which is not sufficient to separate *P. segetum* from *P. pensylvanicum* var. *genuinum* Fernald. The most obvious differences are the greater proportionate length of the leaves of *P. segetum* and their tendency to elongate attenuation, especially at the apical end.

Meisner noted three varieties of *P. segetum*: " α . *genuinum*, staminibus inclusis, calycem aequantibus . . . β . *stamineum*, staminibus exsertis, stylos aequantibus vel superantibus . . . γ . *Lindenii*, staminibus calyce brevioribus, bracteis subacuminatis . . ."

This would indicate heterostyly. Examination of material cited by Meisner for α . *genuinum* (Colombia, *Funke & Schlim*, no. 250) and for β . *stamineum* (Cuba, *Ramon de la Sagra*, no. 187) indicate no greater heterostyl tendency than is often seen in *P. pensylvanicum*. The Cuban specimen is fully fruitful and is in that respect not comparable with the staminate form of *P. longistylum* Small, which is usually of reduced fertility.

The region cited for γ . *Lindenii* (Mexico; *Linden*, no. 107, type not seen by me) and the subacuminate bracts (as contrasted with the "bracteis acutiusculis" of the type) indicate a close affinity with *P. mexicanum* Small, in which the heterostyl tendency is more marked.

P. ludovicianum Meisn.⁴ was reduced by Small⁵ on the ground that "The only distinctive character given is simply pubescent peduncles and pedicels in place of glandular ones. The diagnosis is incorrect, however, as some glands do exist on the original specimen." The

¹ Meisner, in DC. Prodr. xiv. 120 (1856).

² Small, Mon. N. A. Polygon. 72 (1895).

³ Meisner, l. c. 121 (1856).

⁴ Meisner, l. c. 116 (1856).

⁵ Small, *A Preliminary List of American Species of Polygonum*, Bull. Torr. Bot. Cl. xix. 353 (1892).

material seen does not indicate the reestablishment of any of these latter titles of the plant to specific rank.

A Guatemalan plant, allied to *P. segetum* by achene- and habit-characters, but separated by glandularity of stem and harshness of leaf, is proposed in this paper as a new variety of *P. segetum*.

P. mexicanum Small¹ is best defined by its narrow lanceolate foliage and gibbous-concave and dull achene. The tendency to diversity in length of style and stamens noticeable in *P. pensylvanicum* is more evident in the Mexican plant, but the segregate heterostyly of *P. longistylum* seems to be lacking. The plant appears to be a coarse, or sometimes wiry, annual; certain evidently perennial and almost shrubby heterostyled types distributed under this name are proposed in this paper as a new species and variety.

P. longistylum Small² is a reduced counterpart of *P. pensylvanicum* in which the heterostyl habit has become established and segregated, as noted by Robinson.³ Short-styled flowers often lack fertility, but sterility is not so general as in short-styled flowers of the amphibious group. The achenes are smaller than those of *P. pensylvanicum*, more lustrous, and usually with a pronounced gibbosity on one side; generally sharp, they usually lack the elongate point shown in the drawing of Small's Monograph. Those of the long-styled flowers approach that extreme more closely than do the less common ones of the short-styled. The species in the main seems well set off, though in some portions of its range occur forms uncomfortably close to *P. pensylvanicum* var. *laevigatum*.

Nieuwland⁴ sought to identify *P. longistylum* with the problematical *P. bicornis* Raf.⁵ Nieuwland states: ". . . one can scarcely hesitate in believing that this author, or Robin from whom he may have gotten an original description, had in mind or more likely at hand, an abnormally large specimen of *Polygonum longistylum* Small . . . the 'elongated exserted styles' . . . are unique for this plant, and found in no other American *Persicaria*. The locality is . . . the same."

¹ Small, l. c. 356 (1892).

² Small, *New and interesting Species of Polygonum*, Bull. Torr. Bot. Cl. xxi. 169 (1894).

³ Robinson, *Notes on some Polygonums of western North America*, Proc. Bost. Soc. Nat. Hist. xxxi. 265 (1904).

⁴ Nieuwland, *Polygonum longistylum* Small, a Synonym. Am. Midl. Nat. iii. 200 (1914).

⁵ Raf. Fl. Ludov. 29 (1817).

In judging what an author has in mind, particularly in the case of a translation, it is sometimes illuminating to compare the translation with the original and also to review somewhat the circumstances under which the translation was made. Rafinesque's original was the "Flore Louisianaise" of Robin (1807), which was a portion of a several volume account of this writer's travels in that part of the world. To quote from Robin's "Discours Préliminaire" his descriptions were prepared "*sur les lieux, au milieu des bois et des prairies, et toujours en présence de l'objet que je décrivais . . .*"; a model method, yet one that prepared no material for the information of subsequent botanists. Robin followed the system of de Jussieu; he was acquainted with that general scheme of classification but he made (in this case at least) no note of specific names and his descriptions, in some cases at least, are rather vague. The following is the pertinent portion of his notes regarding the plant named by Rafinesque *P. bicorné*, with some notes as to other species:

"*Renouées* (poligonum). *Persicaires*, vulg. *Curages*. Il se trouve ici plusieurs de ces espèces . . . elles s'élèvent de quarte à cinq pieds . . .

Toutes ont à-peu-près le même feuillage, pétiolé alongé, terminé en pointe . . . La plus commune et la plus belle jette de nombreux rameaux alternes, çà et là, à demi-couchés, genouillés, considérablement arrondis, . . . se colorant de pourpre. Chaque branch, chaque brandille portent un épis de fleurs couleur rose, très-touffu, long de deux à trois pouces; les corolles de ces fleurs ont huit étamines; un pistil bicorné s'élève au-dessous des étamines et de la corolle."

It is fairly clear from the autobiography of Rafinesque and also from the accounts of his life by Call and Fitzpatrick that at the time of the appearance of the *Florula Ludoviciana* the translator had never visited Louisiana, had no special knowledge of its flora, and no specimens with which to compare the descriptions of Robin. To quote briefly from Rafinesque's "Preamble"

"In perusing this Flora, I was astonished to find, among many blunders in nomenclature and classification, several accurate descriptions and valuable additions to the knowledge of plants . . . Having, . . . compared . . . his descriptions with the Floras of . . . Michaux and Pursh, I became convinced that a great number of new genera and species . . . were described by Robin . . .

I have undertaken this task . . . an arduous one, owing to the numerous misnames and errors of the author . . .

The result of this labour consists in the enumeration of more than 400 species, whereof 196 are new . . . ”

Rafinesque's version of "*P. bicorné*" is more accurate, except in one and that a rather pertinent particular, than one might expect from an examination of certain other portions of the book. It is also quoted more fully by Nieuwland.

"Caulibus ramosis, ramis geniculatis, patulis teretibus intus crenulatis; foliis petiolatis, lanceolatis, glabris; floribus spicatis confertis octrandis, distylis, staminis inclusis, stylis exsertis elongatis. Raf.—Renouée i. Rob. p. 366. Large plant, four or five feet high, branches purplish, every one of which bears a fine thick spike, about three inches long, of rose colored flowers"

To one who has examined any considerable number of the species of *Polygonum* which characterize the southern United States it will be rather evident that "un pistil bicorné . . . audessus des étamines et de la corolle" is often found in *P. pensylvanicum* itself (to which the *Index Kewensis* refers *P. bicorné*), *P. mexicanum*, *P. segetum*, and the rather large *P. densiflorum* Meisn., none of which are out of the question in the locality of *P. bicorné*. The "elongation" which would seem to refer particularly to *P. longistylum* is the work of Rafinesque, writing in the neighborhood of New York, and not of Robin in Louisiana. *P. longistylum*, although seemingly of too low habit, may of course have been meant. But to quote from Rafinesque's own title page: "*Quand les matériaux sont imparfaits, l'édifice ne peut pas être complet.*"

Greene¹ described *Polygonum omissum*: ". . . whole stem as well as branches and peduncles rough with rather sparse stipitate glands, but foliage glabrous even to margin . . . styles exserted"

Greeley, Colorado, 20th September, 1872. It is no rarity there and elsewhere along the Platte River, and has long been allowed to pass for *P. Pennsylvanicum*."

From this description, and from a specimen collected by Greene in the type locality (the date on the label is not clear, but looks like Sept. 10, 1872) this should be a variety of *P. longistylum*.

The plants discussed above, with the exception of *P. segetum* and *P. longistylum*, are described as annuals, and the material seen would confirm the description. Most specimens of *P. longistylum* seen are first-year plants, and none can be listed as perennial with any degree

¹ Greene, *New Species of Polygonum*, Pittonia, v. 200 (1903).

of certainty. Under *P. mexicanum* there have been distributed from the Gulf States certain specimens which are evidently perennial and have an almost shrubby basal habit. A perennial species, of this shrubby type, also characterized by strigose rather than glandular-hairy peduncles, peculiarly acuminate ocreolae, heterostyl habit and small, dull, narrowly oval achene is here proposed as new. A variety of this species, representing in some respects a median form between the type and *P. longistylum*, is likewise proposed as new.

KEY TO POLYGONUM PENNSYLVANICUM AND RELATED SPECIES.¹

Plants annual or perennial, mostly upright; stems glabrous below (in one variety glandular); upper branches and peduncle clothed with spreading glandular or rarely appressed and simple hairs; panicles mostly dense: achenes lenticular.

- a. Flowers with some tendency to heterostyly, but the types not segregated on separate plants b.
- b. Achenes nearly orbicular, both the sides usually flattened or concave c.
- c. Leaves evidently strigose: achenes 2.2-2.8 mm. broad.
Peduncle covered with spreading glandular hairs
1a. *P. pensylvanicum* var. *genuinum*.
Peduncle covered mostly with simple appressed hairs.
1d. *P. pensylvanicum* var. *durum*.
- c. Leaves glabrous or glabrescent: achenes 2.5-3.5 mm. wide d.
- d. Stems erect: leaves lanceolate, acuminate: stamens 7-8.
Glands of hairs red....1b. *P. pensylvanicum* var. *laevigatum*.
Glands of hairs without pigment
1c. *P. pensylvanicum* var. *laevigatum* f. *pallenscens*.
- d. Stems depressed or subascending: leaves elliptic to oval, obtuse: stamens 5-6...1e. *P. pensylvanicum* var. *nesophilum*.
- b. Achenes ovate; at least one side convexed or gibbous, dull c.
- c. Leaves long-attenuate, minutely strigose d.
- d. Stems glabrous below: margin of leaf ciliate but not harsh.....2. *P. segetum*.
- d. Stems glandular below: margin of leaf harsh with sharp bristles.....2a. *P. segetum* var. *verrucosum*.
- c. Leaves narrow-lanceolate, glabrous or glabrescent...3. *P. mexicanum*.
- a. Flowers definitely heterostyled; the types segregated on different plants e.
- e. Annual or slightly woody perennial: leaves lanceolate, acuminate: achene 2-2.5 mm. wide, shining f.
- f. Peduncles and upper stems only clothed with glandular hairs.....*P. longistylum*.
- f. Major portion of the stem as well as branches clothed with glandular hairs.....4a. *P. longistylum* var. *omissum*.
- e. Perennial with woody base: leaves narrow-lanceolate: achene 1.5-1.7 mm. wide, dull.
Ocreolae elongate-acuminate: peduncles more or less strigose with appressed hairs.....5. *P. mississippiense*.
Ocreolae short-acuminate: peduncles with more or less abortive glandular hairs.....5a. *P. mississippiense* var. *interius*.

¹ Unless otherwise stated, the specimens cited are in the Gray Herbarium.

1a. *POLYGONUM PENNSYLVANICUM* var. *GENUINUM* Fernald, *RHODORA* xix. 70 (1917). Annual: stem 3–12 dm. high, woody below and rather stout, erect and usually much branched, glabrous below, clothed more or less with glandular hairs above, green, reddish, or brownish; nodes somewhat swollen, especially below, often dark-ringed; longer internodes 3–4 cm. long: leaves lanceolate or inequilaterally lanceolate, 1–3.5 cm. wide, 5–20 cm. long, herbaceous, rather sparsely and finely strigose, especially on the veins above, lighter green and more profusely strigose beneath, copiously but usually inconspicuously dotted with internal glands (these in some cases becoming darkened and very apparent), cuneate-rounded at base, long-attenuate to a somewhat flexuous tip, entire; the margin slightly revolute, clothed with minute forward-appressed bristles; petioles 0.5–2 cm. long, attached at the base of the ocrea: ocreae 1–1.5 cm. long, thin-scarious, close cylindric above and becoming looser, disintegrating, and finally disappearing below; at least the upper fine-strigose and often scatteringly clothed with glandular hairs; margin entire or sometimes with inconspicuous bristles: inflorescence much branched: peduncles copiously clothed with glandular hairs 0.25 mm. long; the prominent terminal glands conspicuously reddened: panicles 2–5 cm. long: ocreolae and fascicles much crowded, hiding the axis: ocreolae 3 mm. long, oblique, very obliquely truncate to an acute apex, greenish or rather scarious, often with somewhat hyaline margins; the lower often clothed with glandular hairs; margin with sparse short bristles or more rarely naked: fascicles many-flowered: the bracts brown-scarious and persistent: pedicels 2–3 mm. long, scarcely exceeding the ocreola: flowers mostly perfect and cleistogamous with rather scant pollen: fascicles usually including one or more flowers of the pronouncedly staminate type with abundant (usually normal) pollen; in some plants a pronounced tendency toward heterostyly noticeable: calyx pink, deep-rose or light purple, ovoid-oblong, 3–4 mm. long, 5-parted to below the middle, with rounded lobes; in fruit accrescent, closely fitting the lenticular achene; the sterile flowers smaller: stamens 8 (occasionally 6 or 7), alternating on the base of the calyx with glandular nectaries; filaments usually sub-equal to the calyx-lobes, becoming shorter or somewhat exserted in certain types: style 1.5–2.5 mm. long, 2-cleft to below the middle, the branches usually equalling the calyx-lobes, or shorter or considerably exserted in some instances, in fruit reflexed or recurved and usually contained in but sometimes exserted from the closed accrescent calyx; stigmas capitate or somewhat clavate: achene lenticular, ovoid-pointed 2.2–2.8 mm. wide, 3–3.5 mm. long, usually flattened on one side and somewhat concaved on the other, rather shining.—*P. pensylvanicum* L. Sp. Pl. 362 (1753). *Persicaria pensylvanica* (L.) Small, Fl. S. E. U. S. 377 (1903). Coastal plain from Massachusetts to Mississippi, northward through the Mississippi basin to southern Ontario. Specimens cited by Fernald, l. c.

1b. Var. *LAEVIGATUM* Fernald, l. c. More glabrous as to leaves, ocreae, and ocreolae: flowers usually paler: pedicels longer-exserted: achenes broader (3–3.5 mm.).—The common interior plant passing as *P. pennsylvanicum*, from New Brunswick to South Dakota, Colorado, and southward.

1c. Var. *LAEVIGATUM*, forma **pallescens**, forma nov., planta pallidiora; glandibus flavis. VERMONT: streets, Brattleboro, *Robinson*, no. 143 (TYPE in Gray Herb.). MASSACHUSETTS: Granville, Hampden Co., *Seymour*, no. 71. NEW YORK: Buffalo, "White, constant in color," *Clinton*. PENNSYLVANIA: Sandy Ridge, Chester Co., *I. W. Anderson*, August 13, 1915. The glands recall those of *P. scabrum* Moench, but their structure is typical of this species.

1d. Var. **durum**, var. nov., ab var. genuino recedens pilis pedunculorum plerumque appressis non glandulosis; staminibus 6.—Coastal; South Carolina to Texas. Type from FLORIDA: river-bottom at Chattahoochee Landing, September 12, 1884, *A. H. Curtiss*. The following are also characteristic. SOUTH CAROLINA: Santee Canal, July, *Ravenel*. ALABAMA: Tensaw, August 18, 1904, *Tracy*, no. 8051. MISSISSIPPI: Agricultural College, Oktibbeha Co., *Pollard*, no. 1301. TEXAS: near Texarkana, Bowie Co., alt. 300 ft., *Heller*, no. 4278.

1e. Var. *NESOPHILUM* Fernald, RHODORA xix. 70 (1917). Spreading or subascending, dwarfed and reduced: leaves elliptic-oval, glabrous or minutely roughened, with a central dark spot: ocreae much reduced, greenish: ocreolae short-funnel-form, mostly hidden by the flowers: panicles short, 1–2 cm. long, short-peduncled or nearly sessile: flowers bright rose: fruiting calyx and achene nearly orbicular: stamens 5–6: styles exserted: pollen defective in the type, but achene-production apparently normal.—Nantucket, Massachusetts and Block Island, Rhode Island, in sand.

2. *P. SEGETUM* HBK. Nov. Gen. et Sp. ii. 178 (1818). Perennial: stem procumbent (Kunth) or erect, glabrous below, becoming glandular-hairy on the branches above: leaves (upper leaves only seen) narrow-lanceolate or somewhat falcate, 1–2 cm. wide, 10–20 cm. long, attenuate to both ends, glabrous or minutely scabridulous, especially toward the margin, with minute harsh bristles, sessile or narrowed to and somewhat decumbent on a petiole about 1 cm. long, attached to the lower portion of the ocreae: ocreae 1–2 cm. long, thin-scarious and close-cylindric above except at the branching nodes, somewhat swollen at attachment of leaf, truncate, eciliate, and glabrous: inflorescence somewhat branched: peduncles clothed with minute glandular hairs: panicles 2–4 cm. long, rather closely flowered and slender: ocreolae 2.5–3 mm. long, obliquely truncate, firm-scarious; the margins membranous and eciliate: pedicels rather stout, 2–3 mm. long, scarcely exserted: flowers pink, in general characters resembling those of *P. pennsylvanicum*: calyx 5-lobed: in fruit 3–3.5 mm. long, ovate: stamens 6–7, included in specimens seen: styles about 1.5 mm. long,

2-parted to below the middle, included or barely exerted in fruit; achene 2.0–2.5 mm. wide, 2.5–2.7 mm. long, lenticular, ovate, rather sharply pointed; the sides slightly convex or one slightly concave, minutely glandular and rather dull.—*P. segetum* HBK., l. c.; Sprengel, Syst. ii. 257 (1825); Meisner, Monog. Gen. Polyg. Prodr. 67 (1826) and in DC. Prodr. xiv. 120 (1856); Small, Monog. N. A. Polyg. 72 (1895). *P. segetum* var. *genuinum* and var. *stamineum* Meisner in DC. Prodr. xiv. 120 (1856). *Persicaria segata* (HBK.) Small, Fl. S. E. U. S. 378 (1903).—Louisiana, New Mexico, Texas and southward to northern South America; also in Cuba. The following are typical. LOUISIANA: June (as *P. mite*, var.) from the S. B. Buckley Herb., in Herb. Mo. Bot. Gard. CUBA: *C. Wright*, no. 2247, in Herb. Mo. Bot. Gard. and Herb. N. Y. Bot. Gard., *Ramon de la Sagra*, no. 187, in Herb. N. Y. Bot. Gard. COLOMBIA: *Funke & Schlim*, no. 250, in Herb. N. Y. Bot. Gard.

2a. Var. **verrucosum**, var. nov., caule glanduloso-verrucoso; foliis scabro-hispidis crenulato-undulatis; floribus achaeniisque majoribus, achaeniis 2.7 mm. latis 3–3.2 mm. longis.—Apparently a larger and coarser plant than the type, but probably better treated as a variety rather than a separate species because of the general similarity in flower and fruit. GUATEMALA: Coban. Alta Verapaz, 1350 meters, April, 1908, *H. von Tuerckheim*, no. II. 1207 (TYPE in Herb. Gray; dupl. in Herb. Mo. Bot. Gard.).

3. *P. MEXICANUM* Small, Bull. Torr. Bot. Club, xix. 356 (1892). Annual: stem 4–10 dm. tall, erect or sometimes decumbent and rooting at the nodes below, rather coarse, considerably branched, glabrous or slightly glaucous below, greenish or reddened; internodes 4–6 cm. long; nodes barely swollen: leaves narrowly lanceolate, 1–2 cm. wide, 6–12 cm. long, glabrous or minutely scabrid, with slightly revolute margin, eciliate or in older leaves ciliate with short sparse hairs: ocreae 0.5–1.5 cm. long, minutely hairy, mostly eciliate at margin, rather loose and soon disintegrating: inflorescence much branched, the peduncles more or less sparsely glandular-hairy; panicles 3–4 cm. long, rather close-flowered: ocreolae 2–3 mm. long, glandular-roughened or glabrous, rather acute, usually eciliate: pedicels reddened, rather stout, about equalling the ocreolae: flowers light pink to deep rose, more or less heterostyled, but the segregate heterostyly with consequent loss of fertility in short-styled flowers not manifest in specimens seen: calyx 3 mm. becoming 3.5–4 mm. long in fruit, deeply parted; lobes rounded or more or less acute: stamens 6–8, 2–3.5 mm. long, included or somewhat exerted: style 1–3 mm. long, included or exerted: achene 2.5–3 mm. wide, 2.5–3 mm. long, ovate or orbicular, abruptly pointed, usually gibbous on one side and concave on the other, minutely pitted-roughened and rather dull, commonly with exerted styles.—*Polygonum pensylvanicum* Torr. Bot. Mex. Bound. Surv. 178 (1859); Wats. Proc. Am. Acad. xvii. 147 (1883); not L. *P. mexicanum* Small, l. c. and

Monog. N. A. Polyg. 60 (1895). *Persicaria mexicana* Small, Fl. S. E. U. S. 377 (1903).—Mexico; cited by Small from southern Louisiana and southern Texas; very probably occurs there, but all specimens seen by the writer from north of Mexico which have been referred to *P. mexicanum* belong to *P. mississippiense*, described below. The following are referred to *P. mexicanum*. MEXICO: in paludosis prope Morales, 1876, *Schaffner*, no. 882; Durango and vicinity, along water courses, June, 1896, *Palmer*, no. 236; Guadalajara, October 3, 1903, *Holway*, no. 5101; Valley Zapotlan, Jalisco, August 8, 1905, *Goldsmith*, no. 108.

4. *P. LONGISTYLUM* Small, Bull. Torr. Bot. Club, xxi. 169 (1894). Annual (or perennial?): stem 3–10 dm. high, rather slender, erect, somewhat branching, glabrous below, becoming more or less sparsely clothed with glandular hairs above, greenish or reddish; the nodes in robust plants conspicuously swollen; internodes 3–6 cm. long: leaves lanceolate, 0.5–2 cm. wide, 3–12 cm. long, herbaceous, dull green, glabrous or nearly so, usually dotted with dark glands beneath, somewhat abruptly cuneate and more or less decurrent on the short petiole, attenuate to tip; margin with minute appressed bristles: ocreae 0.25–1 cm. long, thin-membranous, somewhat spreading and soon torn and disappearing; the upper sparsely ciliate; margin entire or minutely ciliate: bracts thin-membranous, persistent: ocreolae and fascicles somewhat crowded: pedicels slender, 2.5–3 mm. long, strongly exserted, equalling or exceeding the achene: flowers pale pink, definitely heterostyled; the two forms typically occurring on separate plants; the long-styled usually, the short-styled more rarely, producing fruit.

Long-styled form. Calyx 2–2.5 mm. long, in fruit becoming 3–3.5 mm. and sharply ovate, deeply 5-parted: stamens 6–8, included, the anthers polliniferous: style 3–4 mm. long, deeply 2-cleft, much exserted in flower and fruit (in the latter sometimes reflexed or recurved and included: stigmas clavate.

Short-styled form. Calyx 3 mm. long, opening widely and usually not closing if fruit is not formed: stamens 2.5–3.5 mm. long, strongly exserted: style 1–1.5 mm. long, 2-cleft to the middle; stigmas capitate: achene 2–2.5 mm. wide, 2.5–3 mm. long, lenticular, ovate or orbicular-ovate, sharp but not usually with elongate point.—Small, l. c. and Monog. N. A. Polyg. 62 (1895); Robinson, Proc. Bost. Soc. Nat. Hist. xxxi. 265 (1904); Robinson & Fernald in Gray Man. ed. 7. 361 (1908). *Persicaria longistyla* Small, Fl. S. E. U. S. 377 (1903).—Low grounds, Illinois to Louisiana, Texas, and New Mexico. The following are cited as typical. ILLINOIS: waste places, St. Clair Co., *Eggert* (in Herb. Mo. Bot. Gard.). MISSOURI: Dunklin Co., *Bush*, no. 117A.; wet soil, Carthage, *E. J. Palmer*, no. 1078 (in Herb. Mo. Bot. Gard.). KANSAS: low ground, Riley County, *J. B. Norton*, no. 457a; dried-up pond, near Osborn City, *Shear*, no. 210. OKLAHOMA: Arkansas, *B. F. Bush*, no. 1425 (in Herb. Mo. Bot. Gard.).

TEXAS: Houston, 1842, *Lindheimer*; Lynchburg, 1842, *Lindheimer*; sandy soil, Harrisburg, 1842. *Lindheimer* (in Herb. Mo. Bot. Gard.); Sutherland Springs, Wilson Co., *E. Palmer*, no. 1180. The older specimens (*Lindheimer*, etc.) were distributed as *P. pensylvanicum*.

4a. Var. **omissum** (Greene), n. comb. Differing from the type in that the glandular hairs clothe at least the entire upper portions of the stem as well as the upper branches and peduncles. Long-styled form only seen.—*P. omissum* Greene, *Pittonia* v. 200 (1903). *Persicaria omissa* Greene. Leaflets i. 24 (1904); Rydberg, *Fl. Rocky Mts.* 236 (1917).—Colorado and probably southward. The following are cited as typical: COLORADO: Greeley, September 10 (?), 1872, *E. L. Greene*. NEW MEXICO: 1847, *A. Fendler*, no. 759 (?); in Herb. Mo. Bot. Gard., a rather fragmentary specimen which apparently belongs here.

5. *P. mississippiense*, sp. nov., perenne basi subligneum erectum imo glabrum; foliis anguste lanceolatis 0.7–1.2 cm. latis 7–10 cm. longis cuneatis breviter petiolatis longe attenuatis minute strigosis subtus glandulosis; ochreis 0.5–0.7 cm. longis minute strigosis breviter ciliatis; pedunculis strigosis sparse glandulosisque; paniculis densis 3–5 cm. longis erectis; ochreolis 4–5 mm. longis acutis vel acuminatis vel cuspidatis valde obliquis glumiformibus subtus margine breviter ciliatis; fasciculis plurifloris; pedicellis gracilibus vix exsertis; floribus heterostylis in eadem planta floribus omnibus longistylibus vel omnibus brevistylibus. *Flores longistyles* calycibus 3 mm. deinde 3.5–4 mm. longis ovatis; staminibus 6–7 inclusis 2 mm. longis; stylo ad mediam 2-partite valde exserto; stigmatibus clavatis. *Flores brevistyles* calycibus staminibusque 4 mm. longis exsertis; stylo 1.5 mm. longo incluso; stigmatibus capitatis; achaeniis 1.5–1.7 mm. latis 2–2.5 mm. longis lenticularibus ovatis acutis nigrescentibus opacis biconvexis.

Perennial: stem 5–8 dm. high, woody and even shrubby at the base, erect, somewhat branched or nearly simple; the stem proper glabrous or nearly so; the herbaceous portion leafy and with reduced leafy branches at the nodes; internodes 3–7 cm. long: leaves narrowly lanceolate, 0.7–1.2 cm. wide, 7–10 cm. long, minutely strigose with sharp hair-points on both surfaces and dark-glandular below, cuneate and somewhat decurrent on the short petiole, long-attenuate; margins and veins fine-strigose: ocreae 0.5–0.7 cm. long, much reduced and some becoming torn and more or less disappearing, minutely strigose and short-ciliate: inflorescence branched, the peduncles clothed with upward-appressed simple hairs with which a few scattered glandular hairs are intermixed; panicle rather crowded. 3–5 cm. long, upright ocreolae 4–5 mm. long, acute or acuminate or even cuspidate, very oblique, with a glume-like appearance, glabrous below, short-ciliate at margin: fascicles several-flowered; pedicels slender and barely exserted: flowers definitely heterostyled, segregated (or nearly so): on different plants.

Long-styled form. Calyx 3 mm. long, becoming 3.5–4 mm. in

fruit, 5-parted nearly to the base, flattened-ovate: stamens 6–7, 1.5–2.0 mm. long, included, polliniferous: style 2-parted to about the middle, strongly exerted in flower and fruit; stigmas clavate.

Short-styled form. Calyx and stamens 4 mm. long, the latter exerted: style 1.5 mm. long, parted to below the middle, included, not much increased in fruit: stigmas capitate.

Achene 1.5–1.7 mm. wide, 2–2.5 mm. long, lenticular, ovate-pointed, nearly black, rather dull, slightly and evenly convexed on both sides.—Mississippi, near the coast; probably in sand. MISSISSIPPI: Long Beach, September 8, 1900, *Tracy & Lloyd*, no. 133 (TYPE in Herb. Gray; duplicate in Herb. Mo. Bot. Gard.); Manuel, *Tracy*, no. 4929 in Herb. Mo. Bot. Gard. Both distributed as *P. mexicanum* (?).

5a. Var. **interius**, var. nov., pedunculis pilis glandulosis plus minusve abortivis sparse munitis; ocreolis acutis.—Oklahoma and Texas. OKLAHOMA: Huntsville, Kingfisher County, August 23, 1896, *L. A. Blankinship* (TYPE in Herb. Gray; duplicate in Herb. Mo. Bot. Gard.). TEXAS: Pierce, *Tracy*, no. 7636. Both distributed as *P. mexicanum*.

WESTERN RESERVE UNIVERSITY.

A KEY TO THE NORTHEASTERN AMERICAN SPECIES OF BIDENS.

NORMAN C. FASSETT.

IN attempting to determine the relationships of several species of *Bidens* it has been found helpful to construct a key to all the members of this genus, native and naturalized, which are found from Maryland to the Gulf of St. Lawrence. Since this includes several species not treated in edition 7 of Gray's Manual, it is here presented.

- a. Achenes flat, or rhomboidal in cross-section, or with winged keels, not conspicuously narrowed to the summit *b*
- b. Achenes cuneate, without winged margins *c*
- c. Awns of firmer texture than the body of the achene, terete or with rounded angles: outer involucrel bracts exceeding the disk *d*
- d. Achenes striate: leaves simple, often deeply cleft *e*
- e. Margins of the achenes antrorsely barbed, at least at the very base *f*
- f. Terminal heads with 8–30 flowers *g*
- g. Achenes nearly linear, plano-convex in cross-section, without midribs, copiously pubescent: awns very slender, spreading, at least $\frac{1}{2}$ as long as the body of the achene.. *B. bidentoides* (Nutt.) Britton.
- g. Achenes flat to bi-convex, with conspicuous midribs, sparsely pubescent: awns stouter,